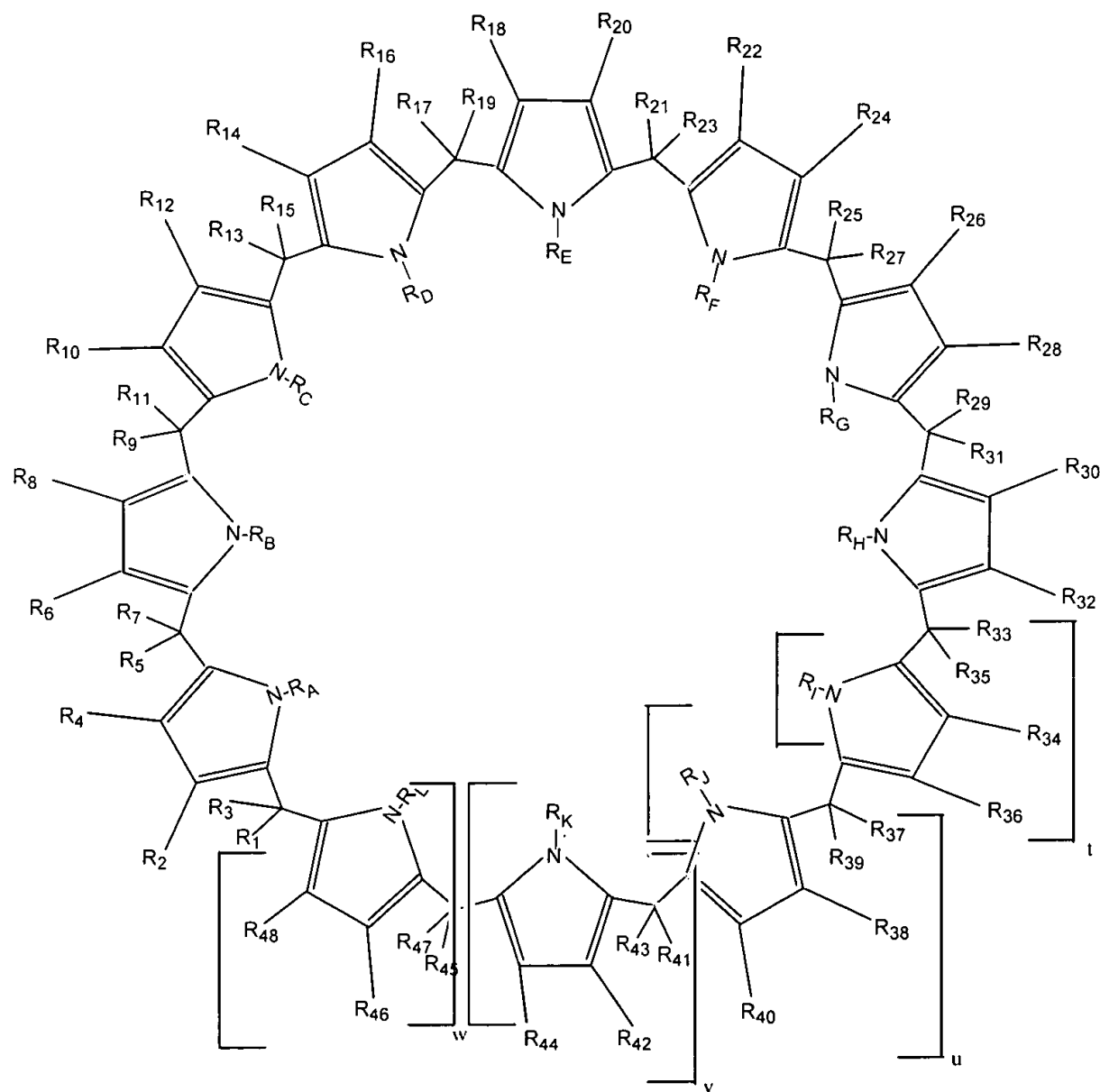


In the claims:

Please cancel claims 12-30.

Please amend claim 8 to read as follows:

--8. (Amended) A compound comprising a fluorinated calix[n]pyrrole having structure VI:



VI

wherein  $n$  is 9, 10, 11, or 12; and

when  $n$  is 9;  $t = 1$ ,  $u = v = w = 0$ , even numbered R substituents are fluoro, odd numbered R substituents are independently as listed in paragraph i) below, and  $R_A - R_I$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 10;  $t = u = 1$ ,  $v = w = 0$ , even numbered R substituents are fluoro, odd numbered R substituents are independently as listed in paragraph i) below, and  $R_A - R_J$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 11;  $t = u = v = 1$ ,  $w = 0$ , even numbered R substituents are fluoro, odd numbered R substituents are independently as listed in paragraph i) below, and  $R_A - R_K$  are independently substituents as listed in paragraph ii) below;

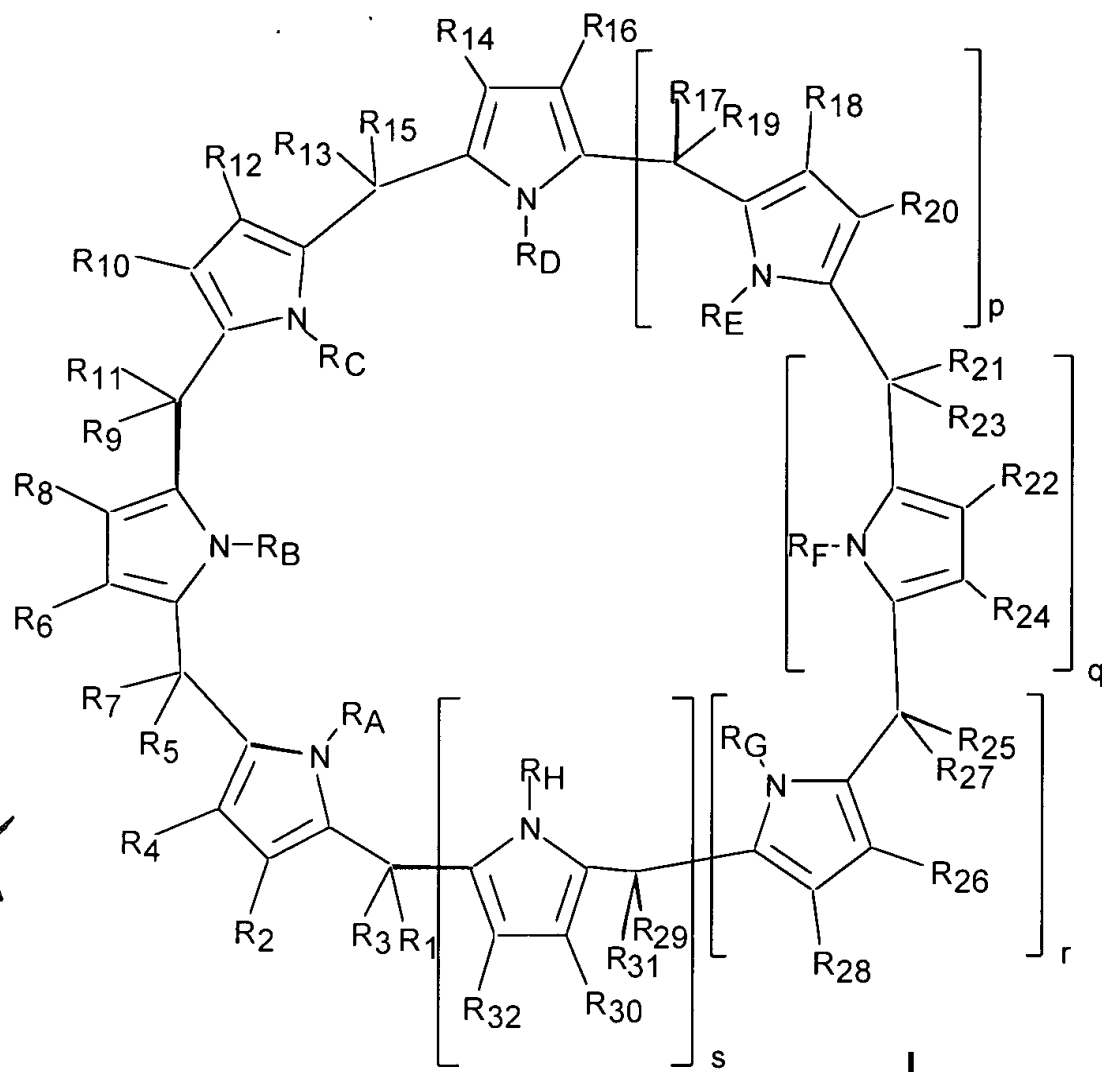
when  $n$  is 12;  $t = u = v = w = 1$ , even numbered R substituents are fluoro, odd numbered R substituents are independently as listed in paragraph i) below, and  $R_A - R_L$  are independently substituents as listed in paragraph ii) below;

- al cont
- i) alkyl, alkenyl, alkynyl, aryl, alkylaryl, formyl, acyl, hydroxyalkyl, hydroxyalkoxy, hydroxyalkenyl, hydroxyalkynyl, saccharide, carboxy, carboxyalkyl, carboxyamide, carboxyamidealkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, tetrahydropyran, tetrahydrothiapyran, thioalkyl, haloalkyl, haloalkenyl, haloalkynyl, alkyl ester, a site-directing molecule, a catalytic group, a reporter group, a binding agent, or a couple that is coupled to a site-directing molecule, to a catalytic group, to a reporter group, or to a binding agent;
  - ii) hydrogen, alkyl, aminoalkyl, alkylsulfone, carboxy alkyl, carboxyamidealkyl, phospho alkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, haloalkyl, aryl, N-oxide, dialkylamino, carbamate, or arylsulfonyl.--

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2 Please add new claims 31-51 as follows

--31. (New) A method of making a halogenated calix[n]pyrrole having structure I:



wherein  $n$  is 4, 5, 6, 7, 8; and

when  $n$  is 4;  $p = q = r = s = 0$ , even numbered  $R$  substituents are fluoro, chloro, or bromo, odd numbered  $R$  substituents are independently as listed in paragraph i) below, and  $R_A - R_D$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 5;  $p = 1, q = r = s = 0$ , even numbered  $R$  substituents are fluoro, chloro, or bromo, odd numbered  $R$  substituents are independently as listed in paragraph i) below, and  $R_A - R_E$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 6;  $p = q = 1, r = s = 0$ , even numbered  $R$  substituents are fluoro, chloro, or bromo, odd numbered  $R$  substituents are independently as listed in

paragraph i) below, and  $R_A - R_F$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 7;  $p = q = r = 1$ ,  $s = 0$ , even numbered  $R$  substituents are fluoro, chloro, or bromo, odd numbered  $R$  substituents are independently as listed in paragraph i) below, and  $R_A - R_G$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 8;  $p = q = r = s = 1$ , even numbered  $R$  substituents are fluoro, chloro, or bromo, odd numbered  $R$  substituents are independently as listed in paragraph i) below, and  $R_A - R_H$  are independently substituents as listed in paragraph ii) below;

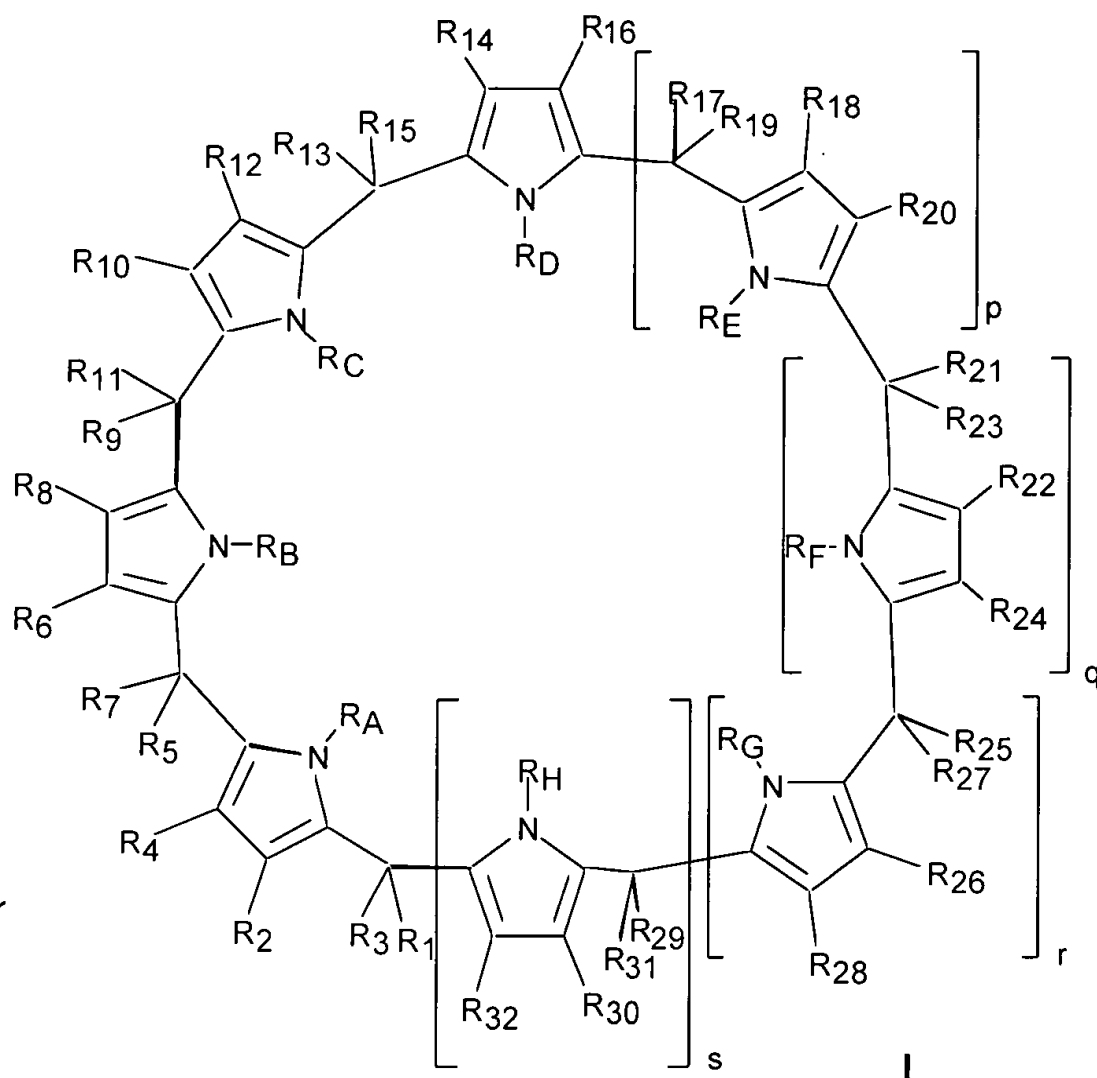
i) alkyl, alkenyl, alkynyl, aryl, alkylaryl, formyl, acyl, hydroxyalkyl, hydroxyalkoxy, hydroxyalkenyl, hydroxyalkynyl, saccharide, carboxy, carboxyalkyl, carboxyamide, carboxyamidealkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, tetrahydropyran, tetrahydrothiapyran, thioalkyl, haloalkyl, haloalkenyl, haloalkynyl, alkyl ester, a site-directing molecule, a catalytic group, a reporter group, a binding agent, or a couple that is coupled to a site-directing molecule, to a catalytic group, to a reporter group, or to a binding agent;

ii) hydrogen, alkyl, aminoalkyl, alkylsulfone, carboxy alkyl, carboxyamidealkyl, phospho alkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, haloalkyl, aryl, N-oxide, dialkylamino, carbamate, or arylsulfonyl;

the method comprising reacting 3,4-dihalopyrrole and a ketone molecule for a time sufficient to produce the halogenated calix[n]pyrrole.

32. (New) The method of Claim 31 wherein the halogenated calix[n]pyrrole is a fluorinated calix[n]pyrrole, all even numbered  $R$  substituents in structure I are fluoro, and the 3,4-dihalopyrrole is a 3,4-difluoropyrrole.

33. (New) A method of removing an anion from an environment containing the anion comprising contacting the environment with a halogenated calix[n]pyrrole having structure I:



when  $n$  is 6;  $p = q = 1$ ,  $r = s = 0$ , even numbered R substituents are fluoro, chloro, or bromo, odd numbered R substituents are independently as listed in paragraph i) below, and  $R_A - R_F$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 7;  $p = q = r = 1$ ,  $s = 0$ , even numbered R substituents are fluoro, chloro, or bromo, odd numbered R substituents are independently as listed in paragraph i) below, and  $R_A - R_G$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 8;  $p = q = r = s = 1$ , even numbered R substituents are fluoro, chloro, or bromo, odd numbered R substituents are independently as listed in paragraph i) below, and  $R_A - R_H$  are independently substituents as listed in paragraph ii) below;

- i) alkyl, alkenyl, alkynyl, aryl, alkylaryl, formyl, acyl, hydroxyalkyl, hydroxyalkoxy, hydroxyalkenyl, hydroxyalkynyl, saccharide, carboxy, carboxyalkyl, carboxamide, carboxamidealkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, tetrahydropyran, tetrahydrothiapyran, thioalkyl, haloalkyl, haloalkenyl, haloalkynyl, alkyl ester, a site-directing molecule, a catalytic group, a reporter group, a binding agent, or a couple that is coupled to a site-directing molecule, to a catalytic group, to a reporter group, or to a binding agent;
- ii) hydrogen, alkyl, aminoalkyl, alkylsulfone, carboxy alkyl, carboxamidealkyl, phospho alkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, haloalkyl, aryl, N-oxide, dialkylamino, carbamate, or arylsulfonyl; and

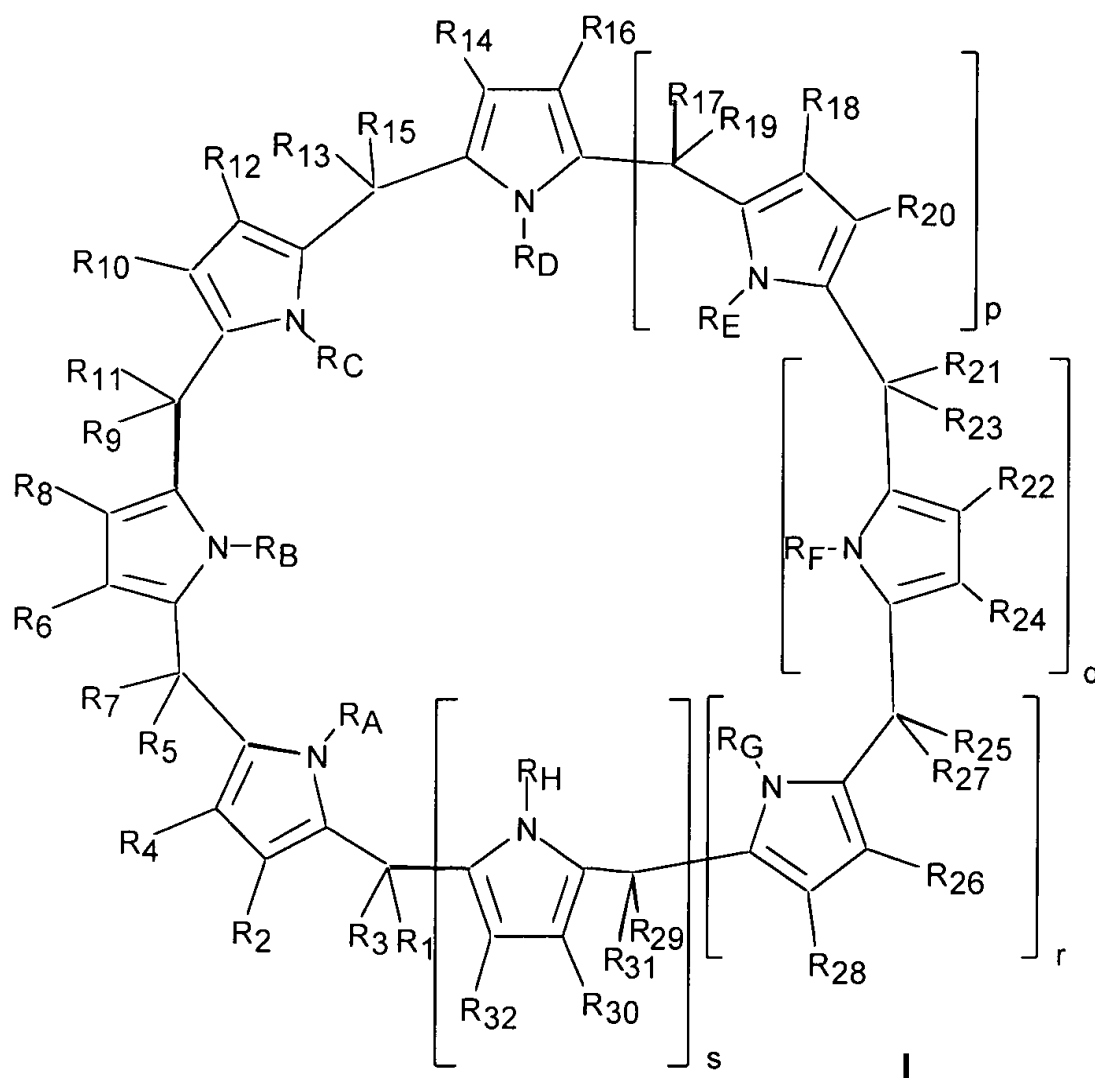
wherein the halogenated calix[n]pyrrole binds the anion thereby removing the anion from the environment.

34. (New) The method of Claim 33 wherein the anion is an environmental pollutant.

35. (New) The method of Claim 33 wherein the anion is fluoride, chloride, or phosphate.

36. (New) The method of Claim 33 wherein the anion is pertechnetate.

37. (New) A method for extracting an ion pair having a cation associated with an anion from an environment containing said ion pair, the method comprising contacting the environment with an anion coextractant and a cation coextractant, wherein the anion coextractant is a calix[n]pyrrole having structure I:



wherein  $n$  is 4, 5, 6, 7, or 8; and

when  $n$  is 4,  $p = q = r = s = 0$ ,  $R_1$  to  $R_{16}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_D$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 5,  $p = 1$ ,  $q = r = s = 0$ ,  $R_1$  to  $R_{20}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_E$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 6,  $p = q = 1$ ,  $r = s = 0$ ,  $R_1$  to  $R_{24}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_F$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 7,  $p = q = r = 1$ ,  $s = 0$ ,  $R_1$  to  $R_{28}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_G$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 8,  $p = q = r = s = 1$ ,  $R_1$  to  $R_{32}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_H$  are independently substituents as listed in paragraph ii) below;

02  
cont

i) hydrogen, halide, hydroxyl, alkyl, alkenyl, alkynyl, aryl, alkylaryl, nitro, phospho, formyl, acyl, hydroxyalkyl, alkoxy, hydroxyalkoxy, hydroxyalkenyl, hydroxyalkynyl, saccharide, carboxy, carboxyalkyl, carboxyamide, carboxyamidealkyl, amino, amido, aminoalkyl, phosphoalkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, tetrahydropyran, tetrahydrothiapyran, thioalkyl, haloalkyl, haloalkenyl, haloalkynyl, alkyl ester, a site-directing molecule, a catalytic group, a reporter group, a binding agent, or a couple that is coupled to a site-directing molecule, to a catalytic group, to a reporter group, or to a binding agent;

ii) hydrogen, alkyl, aminoalkyl, carboxy alkyl, carboxyamidealkyl, phospho alkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, haloalkyl, aryl, N-oxide, dialkylamino, carbamate, or arylsulfonyl;

wherein odd-numbered R substituents are other than hydrogen; and



wherein the calix[n]pyrrole binds the anion and the cation coextractant binds the cation thereby allowing for removal of the ion pair from the environment.

38. (New) The method of Claim 37 wherein the calix[n]pyrrole is a halogenated calix[n]pyrrole, and even-numbered R substituents in structure I are fluoro, chloro, or bromo.

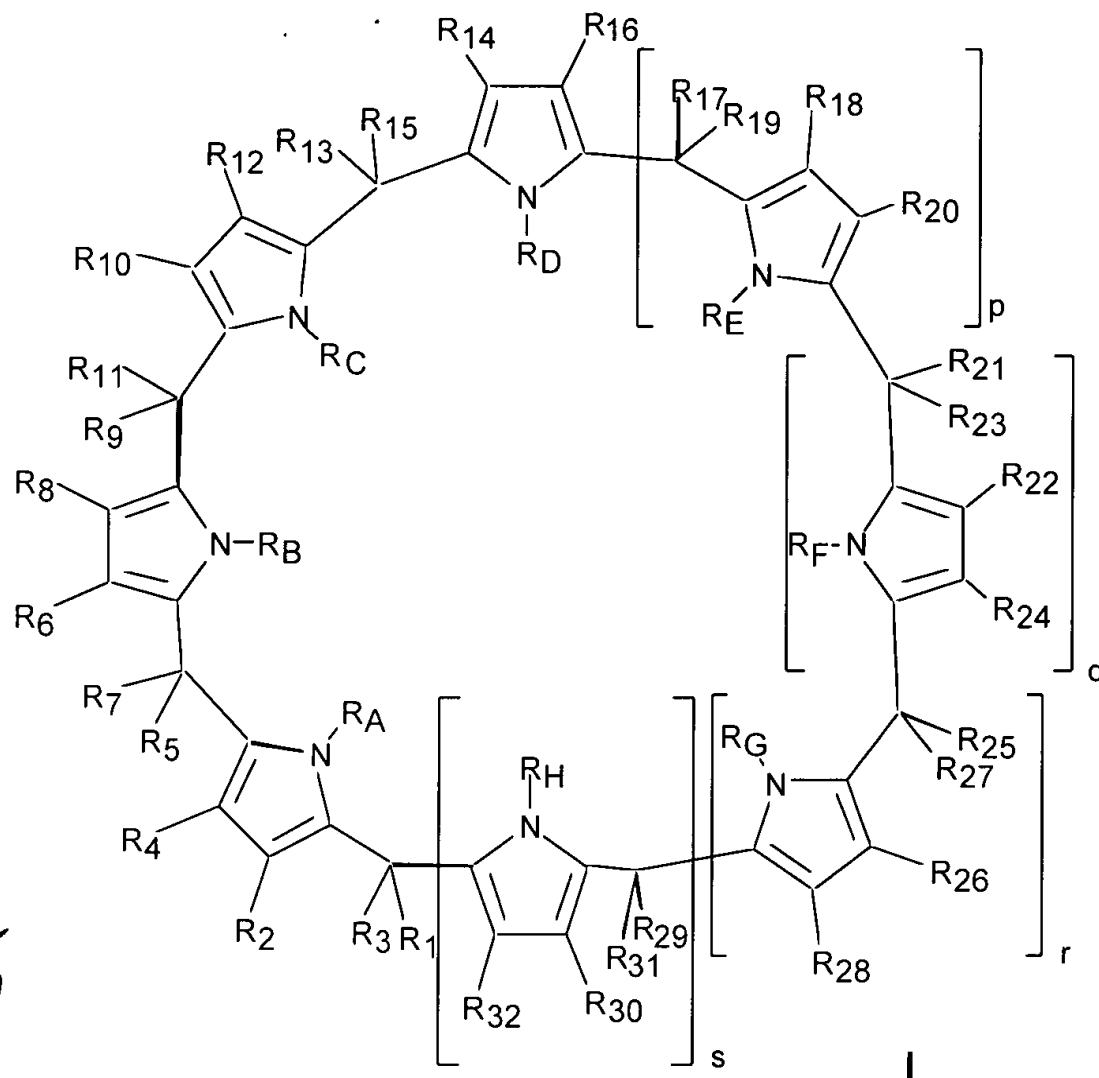
39. (New) The method of Claim 37 wherein the calix[n]pyrrole is a fluorinated calix[n]pyrrole, and even-numbered R substituents in structure I are fluoro.

40. (New) The method of Claim 37 wherein the ion pair is an environmental pollutant.

41. (New) The method of Claim 37 wherein the cation coextractant is a crown ether, a calixarene-crown ether cryptand, or a calixarene-crown ether conjugate.

42. (New) The method of Claim 37 wherein the cation coextractant is a cation exchanger.

43. (New) A method for reducing or preventing corrosion on a substrate susceptible to corrosion in the presence of a corrosion-promoting anion, comprising contacting the substrate with a calix[n]pyrrole having structure I:



wherein n is 4, 5, 6, 7, or 8; and

when n is 4,  $p = q = r = s = 0$ ,  $R_1$  to  $R_{16}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_D$  are independently substituents as listed in paragraph ii) below;

when n is 5,  $p = 1$ ,  $q = r = s = 0$ ,  $R_1$  to  $R_{20}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_E$  are independently substituents as listed in paragraph ii) below;

when n is 6,  $p = q = 1$ ,  $r = s = 0$ ,  $R_1$  to  $R_{24}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_F$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 7,  $p = q = r = 1$ ,  $s = 0$ ,  $R_1$  to  $R_{28}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_G$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 8,  $p = q = r = s = 1$ ,  $R_1$  to  $R_{32}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_H$  are independently substituents as listed in paragraph ii) below;

- 02  
cont
- i) hydrogen, halide, hydroxyl, alkyl, alkenyl, alkynyl, aryl, alkylaryl, nitro, phospho, formyl, acyl, hydroxyalkyl, hydroxyalkoxy, alkoxy, hydroxyalkenyl, hydroxyalkynyl, saccharide, carboxy, carboxyalkyl, carboxyamide, carboxyamidealkyl, amino, amido, aminoalkyl, phosphoalkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, tetrahydropyran, tetrahydrothiapyran, thioalkyl, haloalkyl, haloalkenyl, haloalkynyl, alkyl ester, a site-directing molecule, a catalytic group, a reporter group, a binding agent, or a couple that is coupled to a site-directing molecule, to a catalytic group, to a reporter group, or to a binding agent;
- ii) hydrogen, alkyl, aminoalkyl, carboxy alkyl, carboxyamidealkyl, phospho alkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, haloalkyl, aryl, N-oxide, dialkylamino, carbamate, or arylsulfonyl;

wherein odd-numbered R substituents are other than hydrogen; and

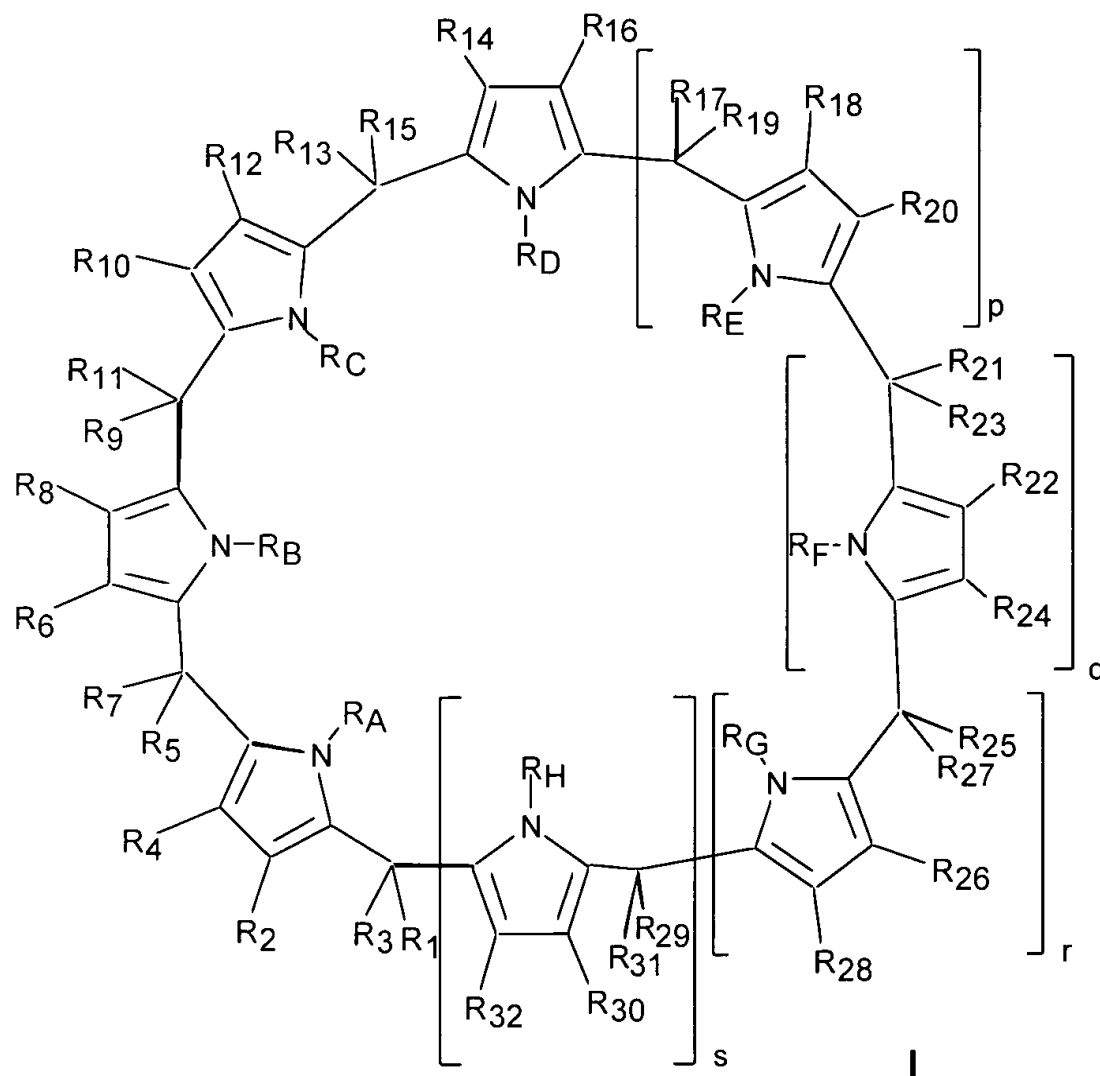
wherein the calix[n]pyrrole binds the corrosion-promoting anion, thereby reducing or preventing corrosion of the substrate.

44. (New) The method of Claim 43 wherein the calix[n]pyrrole is a halogenated calix[n]pyrrole, and even-numbered R substituents in structure I are fluoro, chloro, or bromo.

45. (New) The method of Claim 43 wherein the calix[n]pyrrole is a fluorinated calix[n]pyrrole, and even-numbered R substituents in structure I are fluoro.

46. (New) The method of Claim 43 wherein the substrate is gasoline or jet fuel and the anion is a chloride anion.

47. (New) A method for producing a naked cation in a solution containing said cation paired with an anion, the method comprising contacting a calix[n]pyrrole having structure I:



wherein n is 4, 5, 6, 7, or 8; and

when n is 4, p = q = r = s = 0, R<sub>1</sub> to R<sub>16</sub> are independently substituents as listed in paragraph i) below, and R<sub>A</sub> - R<sub>D</sub> are independently substituents as listed in paragraph ii) below;

when  $n$  is 5,  $p = 1$ ,  $q = r = s = 0$ ,  $R_1$  to  $R_{20}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_E$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 6,  $p = q = 1$ ,  $r = s = 0$ ,  $R_1$  to  $R_{24}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_F$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 7,  $p = q = r = 1$ ,  $s = 0$ ,  $R_1$  to  $R_{28}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_G$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 8,  $p = q = r = s = 1$ ,  $R_1$  to  $R_{32}$  are independently substituents as listed in paragraph i) below, and  $R_A - R_H$  are independently substituents as listed in paragraph ii) below;

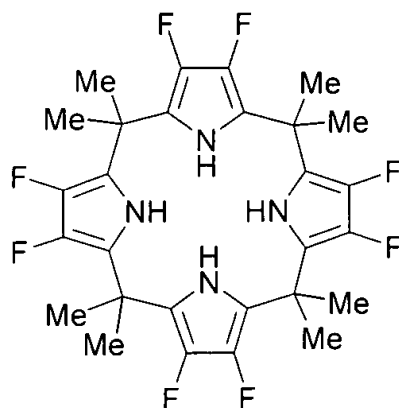
- A2 cont
- i) hydrogen, halide, hydroxyl, alkyl, alkenyl, alkynyl, aryl, alkylaryl, nitro, phospho, formyl, acyl, hydroxyalkyl, hydroxyalkoxy, alkoxy, hydroxyalkenyl, hydroxyalkynyl, saccharide, carboxy, carboxyalkyl, carboxyamide, carboxyamidealkyl, amino, amido, aminoalkyl, phosphoalkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, tetrahydropyran, tetrahydrothiapyran, thioalkyl, haloalkyl, haloalkenyl, haloalkynyl, alkyl ester, a site-directing molecule, a catalytic group, a reporter group, a binding agent, or a couple that is coupled to a site-directing molecule, to a catalytic group, to a reporter group, or to a binding agent;
  - ii) hydrogen, alkyl, aminoalkyl, carboxy alkyl, carboxyamidealkyl, phospho alkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, haloalkyl, aryl, N-oxide, dialkylamino, carbamate, or arylsulfonyl;

wherein odd-numbered R substituents are other than hydrogen;

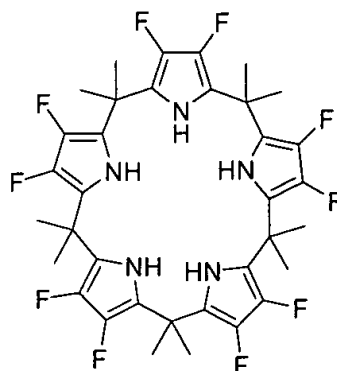
with the solution, wherein the calix[n]pyrrole binds the anion thereby providing the naked cation.

48. (New) The method of Claim 37 wherein the cation is cesium.

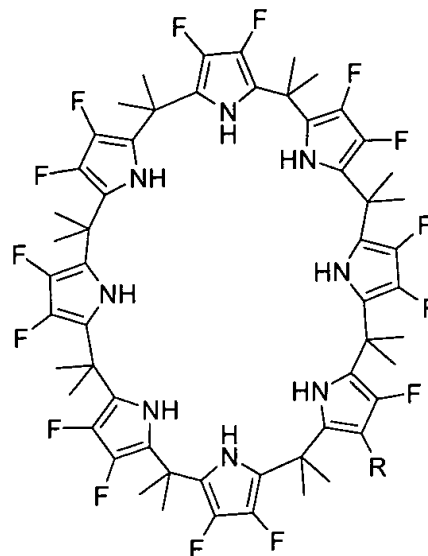
49. (New) A compound selected from the group consisting of compounds **44**, **46**, **48**, **50**, and **52**:



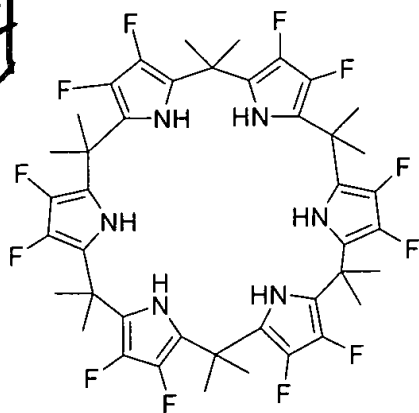
**44**



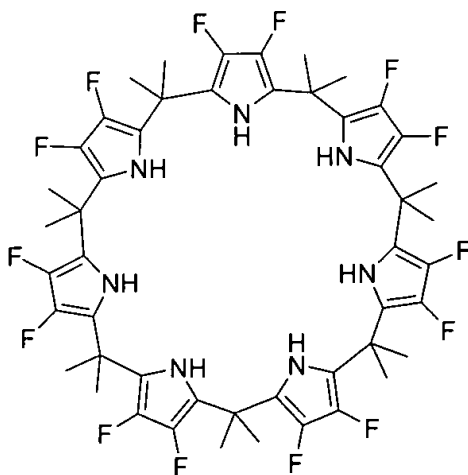
**46**



**48**

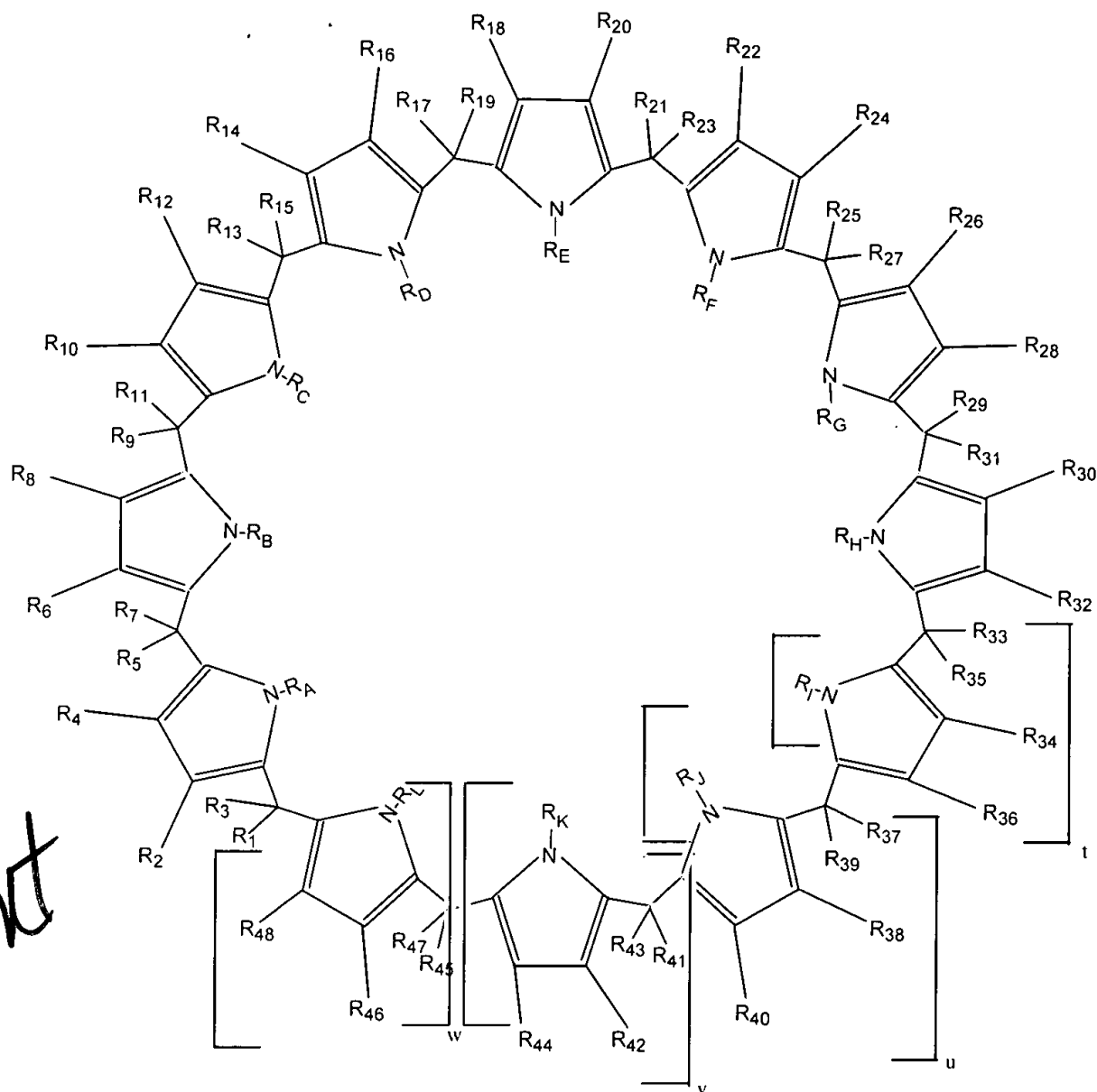


**50**



**52**

50. (New) A method of making a halogenated calix[n]pyrrole having structure **VI**:



VI

wherein  $n$  is 9, 10, 11, or 12; and

when  $n$  is 9;  $t = 1$ ,  $u = v = w = 0$ , even numbered  $R$  substituents are fluoro, chloro, or bromo, odd numbered  $R$  substituents are independently as listed in paragraph i) below, and  $R_A - R_I$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 10;  $t = u = 1$ ,  $v = w = 0$ , even numbered  $R$  substituents are fluoro, chloro, or bromo, odd numbered  $R$  substituents are independently as listed

in paragraph i) below, and  $R_A - R_J$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 11;  $t = u = v = 1$ ,  $w = 0$ , even numbered  $R$  substituents are fluoro, chloro, or bromo, odd numbered  $R$  substituents are independently as listed in paragraph i) below, and  $R_A - R_K$  are independently substituents as listed in paragraph ii) below;

when  $n$  is 12;  $t = u = v = w = 1$ , even numbered  $R$  substituents are fluoro, chloro, or bromo, odd numbered  $R$  substituents are independently as listed in paragraph i) below, and  $R_A - R_L$  are independently substituents as listed in paragraph ii) below;

A2  
cancel

i) alkyl, alkenyl, alkynyl, aryl, alkylaryl, formyl, acyl, hydroxyalkyl, hydroxyalkoxy, hydroxyalkenyl, hydroxyalkynyl, saccharide, carboxy, carboxyalkyl, carboxyamide, carboxyamidealkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, tetrahydropyran, tetrahydrothiapyran, thioalkyl, haloalkyl, haloalkenyl, haloalkynyl, alkyl ester, a site-directing molecule, a catalytic group, a reporter group, a binding agent, or a couple that is coupled to a site-directing molecule, to a catalytic group, to a reporter group, or to a binding agent;

ii) hydrogen, alkyl, aminoalkyl, alkylsulfone, carboxy alkyl, carboxyamidealkyl, phospho alkyl, alkyl sulfoxide, alkyl sulfone, alkyl sulfide, haloalkyl, aryl, N-oxide, dialkylamino, carbamate, or arylsulfonyl;

the method comprising reacting 3,4-dihalopyrrole and a ketone molecule for a time sufficient to produce the halogenated calix[n]pyrrole.

51. (New) The method of Claim 50 wherein the halogenated calix[n]pyrrole is a fluorinated calix[n]pyrrole, all even numbered  $R$  substituents in structure VI are fluoro, and the 3,4-dihalopyrrole is a 3,4-difluoropyrrole.--